



D E F E N S E  
A N D A R M S  
C O N T R O L  
S T U D I E S  
P R O G R A M

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*Annual Report*

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MASSACHUSETTS  
INSTITUTE  
OF TECHNOLOGY

*1993–1994*

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE <b>1994</b>		2. REPORT TYPE <b>N/A</b>		3. DATES COVERED <b>-</b>	
4. TITLE AND SUBTITLE <b>Massachusetts Institute of Technology Defense &amp; Arms Control Studies Program</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>Security Studies Program Massachusetts Institute of Technology 292 Main Street (E38-600) Cambridge, MA 02139</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release, distribution unlimited</b>					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>SAR</b>	18. NUMBER OF PAGES <b>32</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

**DEFENSE AND ARMS CONTROL  
STUDIES PROGRAM**

**T**he Defense and Arms Control Studies (DACS) Program is a graduate-level, research and training program based at the MIT Center for International Studies. It traces its origins to two initiatives. One is the teaching on international security topics that Professor William Kaufmann began in the 1960s in the MIT Political Science Department. The other is the MIT-wide seminars on nuclear weapons and arms control policy that Professor Jack Ruina and Professor George Rathjens created in the mid 1970s.

The Program's teaching ties are primarily but not exclusively with the Political Science Department at MIT. The DACS faculty, however, includes natural scientists and engineers as well as social scientists. Of particular pride to the Program is its ability to integrate technical and political analyses in studies of international security issues.

Several of the DACS faculty members have had extensive government experience. They and the other Program faculty advise or comment frequently on current policy problems. But the Program's prime task is educating those young men and women who will be the next generation of scholars and practitioners in international security policy making. The Program's research and public service activities necessarily complement that effort.

The Center for International Studies is a major unit of the School of Humanities and Social Sciences at MIT and seeks to encourage the analysis of issues of continuing public concern. Key components of the Center in addition to DACS are Seminar XXI, which offers training in the analysis of international issues for senior military officers, government officials, and industry executives; and the MIT Japan Program, which conducts research and educational activities to further knowledge about Japanese technology, economic activities, and politics.

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DEFENSE AND ARMS CONTROL STUDIES PROGRAM  
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*COVER PHOTO: MINUTEMAN STATUE  
BATTLE GREEN, LEXINGTON, MASSACHUSETTS  
PHOTOGRAPH BY HARVEY M. SAPOLSKY*

## REPORT OF THE DIRECTOR

It is less than five years since the Berlin Wall was breached and less than three since the Soviet Union collapsed. Thus no one should be surprised that the United States has yet to formulate a coherent defense strategy for itself, let alone organize a framework for cooperative security among the major nations of the world. For more than fifty years America maintained exceptionally large military forces, mobilized important portions of its industry and science for defense, and found cause to fight several major wars far from its shores. It is surely to be expected that the nation would want at least a brief respite from international responsibilities when the Cold War ended.

But it is not just a collective desire for a vacation that delays the formulation of a coherent defense policy or the implementation of a design for world order. To begin with, we tend to exaggerate the role of formal planning in guiding our action during the Cold War or even the Second World War. In both conflicts the military believed that vastly more human and material resources were needed to meet the threat than elected officials dared to seek from the American public. As Carl Builder has pointed out, the persistent gap between proclaimed requirements and fieldable forces made a mockery of most planning efforts. Defense decisions were always as much the product of a struggle among bureaucracies for relative advantage and Congressional interests than they were an exercise in rational analysis. The wait then for a logical, finely calibrated strategy to be put in place when a threat on the scale of Fascism or Communism is absent will likely be a very long one indeed.

A prerequisite for a post Cold War strategy, it would seem, would be a public consensus on America's role in the world. Every war has its political lesson, the public consensus about the experience, that then guides future policy. The lesson at the end of the First World War was that the United States should avoid getting involved in power struggles among European nations. This lesson kept the United States from taking part in the League of Nations and other fora where international disputes would later be considered. Because the consensus was so strongly held it was extraordinarily difficult to get the United States involved in the fight against Hitler even though the Nazi threat was not only to Europe, but also to our own web of relationships with Europe, and, indeed, the entire world. It took an attack against our territory by an Axis power and a declaration of war by Hitler to engage us fully.

Of course, the lesson of the Second World War, a lesson which the U.S. military helped craft, was the opposite one — that the United States should be prepared to defend its prime international interests wherever and whenever they are challenged. With this lesson we came to support very large standing forces for the first time in our history and sought the placement of these forces across the globe. We developed a two ocean Navy, a forward deployed Army, and an Air Force that was the embodiment of our greatest technological achievements. Our unwillingness to ignore challenges to this strategy, no matter how distant, debatable or difficult to meet, led to the costly involvements in Korea and Vietnam.

The debate over what will be the political lesson of the Cold War is just beginning. Many appear to believe that the Soviet Union collapsed because of the pressure of American military preparedness. Some even claim that it was the specific burden of trying to match President Reagan's Strategic Defense Initiative that fatally exhausted the Soviet Union. However, others think this is absurd and argue that it was the Soviet Union's persistent and vast internal problems that forced the collapse. In their view the Soviet system gradually rotted away from corruption, repression, and inefficiency. Important implications for American defense budgets and foreign policy would follow a resolution of the debate. Should the United States always challenge aggression or simply isolate itself from aggression? Do we need to keep large forces or can we demobilize

most of them? The debate though is currently quite confused as some on the political left urge an active world role for the United States, but refuse to cite Cold War experience as justification while some on the right wish to maintain preparedness, but find no role for American forces in tempering the chaos of the post Cold War world.

The prevailing policy of large defense budgets (our's essentially equals that of all other nations combined) and only limited world engagements, as much a compromise as it appears to be, is not sustainable politically. First, without the likelihood of significant engagements, the combat readiness of the forces will be eroded by ever increasing pork barrel demands on the defense budget. Second, without a consensus on



PHOTOGRAPH COURTESY OF DEPARTMENT OF DEFENSE

*During the Cold War we knew where to look*

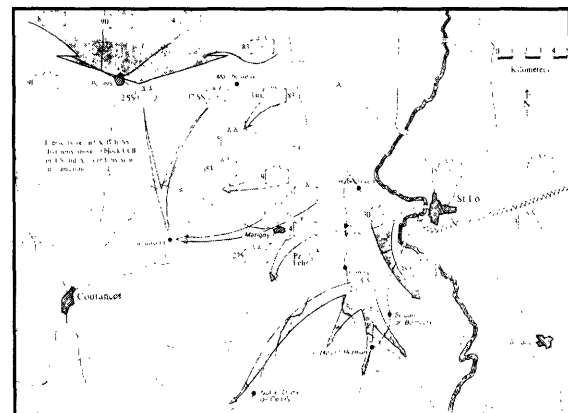
**REPORT OF  
THE DIRECTOR**

where force should be used, the ability to accept even limited casualties in overseas deployments will be near nonexistent.

It is these and related issues that have absorbed the attention of the Program during the past year. The Program is built around several Working Groups, each a research collaboration of faculty, graduate students, and visitors and each with a distinctive focus and research style. For example, the New Directions Group, led by Professors George Rathjens, Carl Kaysen and Jack Ruina, has examined when and how the United States might participate in international humanitarian and peacemaking interventions. My own Defense Politics Group has studied the casualty issue, this year inviting each of the armed services to describe their models for estimating casualties and reflecting on recent experience with casualty producing deployments of American forces.

The Defense Industries Working Group, which I also lead, spent the year exploring the political dynamics that sustain or close major defense production lines such as those for fighter aircraft and warships. It also looked into the administration's conversion, defense procurement reform, technology promotion, and industrial base policies. Much of the Group's activities were undertaken in conjunction with the MIT Lean Aircraft Initiative, a research project based in the MIT Aeronautics and Astronautics Department and supported by the Air Force and a consortium of aircraft contractors.

Work on a parallel set of issues forms the agenda of the Post Soviet Security Project, the new name for Professor Stephen Meyer's long established Group. Political turmoil in and around Russia, however, adds a level of difficulty to policy making that is fortunately absent from the American experience. Proliferation risks, although perhaps exaggerated, make the prosperity of the Russian defense industry a topic of broad interest. Acute environmental problems in Russia, many a legacy of the Cold War, also attract attention. Here there are more parallels with the American situation, which is the focus of DACS' Defense Environmental Group.



*Cobra breakthrough – U.S. attacks on July 27, 1944*

Professor Barry Posen's Conventional Forces Group has nearly completed its analysis of breakthrough armored battles. Through a series of carefully formatted case studies of Western Front battles during the Second World War, the Group is seeking general lessons about this crucial type of military operation. The battles, from Normandy to the Rhein, are celebrating their anniversary this year.

DACS' Defense Technology Group, which is led by Professor Theodore Postol, has had an important role in shaping public debate over ballistic missile defenses. Their critical analysis of Gulf War Patriot missile-Scud intercept engagements eventually won wide acceptance after much official disparagement. More recently the Group has been analyzing implications proposed theater defense systems have for the viability of the Anti-ballistic Missile Treaty. Here too their work is likely to have an important impact on public policy.

Nuclear proliferation issues have been a long term specialization of the Program. Dr. Marvin Miller has led much of the effort in recent years which includes analysis of proliferation experience and risks in the Middle East and work on American counter proliferation initiatives. In February DACS cosponsored with the Natural Resources Defense Council a symposium in Cambridge on U.S. nuclear policies which brought together many officials and

academic specialists for free ranging discussions of current policy trends relating to nuclear weapons.

DACS cosponsored two other symposia during this year. In October we helped the MIT Industrial Liaison Program organize a symposium on defense industry conversion with a special focus on federal and state assistance for company initiatives. About 100 officials and company representatives attended the sessions which have since served as a model for others wishing to be involved in aiding conversion.

A second workshop, this one cosponsored by the Lean Aircraft Project, was held in April in conjunction with the General James H. Doolittle Dinner and had as its focus acquisition reform proposals. Jimmy Doolittle was not only a Second World War hero, but also one of the first PhDs in aviation engineering from MIT, having received that degree in 1925 while a junior officer in the Army Air Corps. DACS is helping organize an annual tribute to General Doolittle who symbolizes the long involvement MIT and the Boston area has had with military aviation in the United States.

The inaugural session brought together Air Force and defense researchers to hear General Ronald Fogleman, USAF, Commander in Chief, U.S. Transportation Command, to discuss Air Force acquisition policy;



PHOTOGRAPH COURTESY OF DEPARTMENT OF DEFENSE

*Will they be frequent flyers?*



PHOTOGRAPH COURTESY OF UNIVERSITY OF CALIFORNIA LAWRENCE LIVERMORE NATIONAL LABORATORY

*What is next for Livermore? What is next for the defense industries?*

C.V. Glines, Doolittle's biographer, to discuss General Doolittle's distinguished career; and David Lampe of MIT to discuss MIT's role in military science and technology. The accompanying workshop on acquisition reform also had an excellent cast: MIT's Richard Samuels on Japanese military technology policy; Brookings's Tom McNaugher on prospects of reform; a Senate staff aid Brig. General John Douglass (USAF Ret.) on current legislation; and OTA's Jack Nunn on the industrial base problem.

We have several departures and a retirement to note. My long time administrative assistant Judith Spitzer, usually a keen observer of the current scene, somehow misread the end of the Cold War as the end of history and decided to move over to the MIT Technology and Society Program where history never ends. As an audit reveals nothing missing except Judy, I can wish her well. All of us though must express our sincere appreciation for her dedication and good spirit. Fortunately, she is nearby and endorses her replacement, Annmarie Cameron.

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## REPORT OF THE DIRECTOR

Unlike our students, our military fellows have a set time to leave. We benefitted from having Captain Ted Wile of the Navy and Major Mike Hodge of the Air Force with us for the year. Military fellows give us special insight into the organizations and issues we study. Captain Wile heads off for the U.S. naval staff in London and Major Hodge returns to flying at Nellis AFB in Nevada.

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**REPORT OF  
THE DIRECTOR**

Jack Ruina, one of our founding fathers, and long time director of the Program, retired from teaching in June. His accomplishments in engineering, security studies, government service and university administration are many, but we would put the establishment of DACS near the very top of the list. Such achievement allows no retirement from the Program. We are pleased to report that Jack will retain an office with us and will continue to pursue several research and writing projects under the DACS banner.

The annual report gives me opportunity to thank those who have helped us during the year. Three colleagues in political science have been especially

involved with our students and have to be considered essentially DACS associates. They are: Stephen Van Evera, a leading theorist in international relations, Ken Oye, Director of our host institution, the MIT Center for International Studies, and a well known specialist in international trade and security issues, and Richard Samuels, Chair of the Political Science Department, home base for several of us, Director of the MIT Japan Program, our upstairs neighbor, and a widely recognized specialist in the Japanese defense industry.

We are grateful to our several sponsors: the Carnegie Corporation of New York, the Ford Foundation, the John D. and Catherine T. MacArthur Foundation, the W. Alton Jones Foundation, the Ploughshares Fund, the John Merck Fund, the Department of Defense, the Department of Energy, the Sloan Foundation, the MIT Lincoln Laboratory, MITRE Corporation, and the MIT Lean Aircraft Initiative.

Harvey M. Sapolsky



**HARVEY M. SAPOLSKY** is Professor of Public Policy and Organization in the Department of Political Science and Director of both the Defense and Arms Control Studies Program and the MIT Communications Forum. Dr. Sapolsky completed a B.A. at Boston University and earned an M.P.A. and Ph.D. at Harvard University. He has worked in a number of public policy areas, notably health, science, and defense and specializes in effects of institutional structures and bureaucratic politics on policy outcomes. In the defense field he has served as a consultant to the Commission on Government Procurement, the Office of the Secretary of Defense, the Naval War College, the Office of Naval Research, and the RAND Corporation, and has lectured at all of the service academies. He is currently focusing his research on three topics: interservice and civil/military relations; the impact of casualties on U.S. use of force; and the structure of defense industries. In July 1989 he succeeded Professor Ruina as Director of the MIT Defense and Arms Control Studies Program. Professor Sapolsky's most recent defense-related book is titled *Science and the Navy*, and is a study of military support of academic research. A volume on telecommunications policy he co-edited has just appeared.



**CARL KAYSEN** is David W. Skinner Professor of Political Economy Emeritus in the Program in Science, Technology, and Society and a Senior Lecturer at the MIT Center for International Studies. Dr. Kaysen earned his B.A. in Economics at the University of Pennsylvania, and his Ph.D. at Harvard University, where he was an economics professor from 1950-1966. From 1966 until 1976, when he came to MIT, he was Director of the Institute for Advanced Study in Princeton and from 1961-1963 he was the Deputy Special Assistant for National Security Affairs to President Kennedy. He has served as a consultant to RAND, the Defense Department, and the CIA. A member of the Committee on Security Studies of the American Academy of Arts and Sciences, Dr. Kaysen is currently engaged in organizing a project under the Committee's auspices on emerging norms of justified international intervention.



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**FACULTY**



**STEPHEN M. MEYER** is Professor of Defense and Arms Control Studies and Director of Soviet Security Studies at MIT. Prior to joining the MIT faculty in 1979, he was a post-doctoral fellow at Harvard University's Center for Science and International Affairs. He received his Ph.D. at the University of Michigan, Ann Arbor in 1978. Dr. Meyer's areas of particular interest are

defense decision-making, military economics, force planning and analysis, and arms control in the former Soviet Union. His current work examines the rise and fall of Soviet military power and the ways in which domestic organizations and institutions influenced Soviet defense policy. Dr. Meyer serves as an advisor on Soviet security affairs to several U.S. government agencies and has testified numerous times in open and closed hearings before the House Armed Services Committee, the Senate Armed Services Committee, the Senate Foreign Relations Committee and the Senate Select Committee on Intelligence.



**MARVIN M. MILLER** is a Senior Research Scientist in the Department of Nuclear Engineering and a member of the MIT Center for International Studies. After undergraduate work at the City College of New York he earned an M.A. in Physics from the University of Rochester and a Ph.D. in Electrical Engineering from the Polytechnic Institute of New York. Prior to joining MIT in 1976, Dr. Miller was an associate professor of electrical engineering at Purdue University working on laser theory and

applications. His current research interests are arms control, particularly nuclear proliferation, and the environmental impacts of energy use. He has studied proliferation issues since 1977, including both country-specific and generic problems. In the former, his main interests are in the Middle East and South Asia, while in the latter he has concentrated on international safeguards and export controls for sensitive nuclear technologies. From 1984 to 1986, Dr. Miller was a Foster Fellow with the Nuclear Weapons and Control Bureau of the U.S. Arms Control and Disarmament Agency (ACDA) and is currently a consultant on proliferation issues for ACDA, and Lawrence Livermore National Laboratory.

**BARRY R. POSEN** is Professor of Political Science. His most recent book, *Inadvertent Escalation*, was released from Cornell University Press in Fall, 1991. His first book, *The Sources of Military Doctrine*, won the American Political Science Association's Woodrow Wilson Foundation Book Award for the best book published in political science in 1984, and Ohio State University's

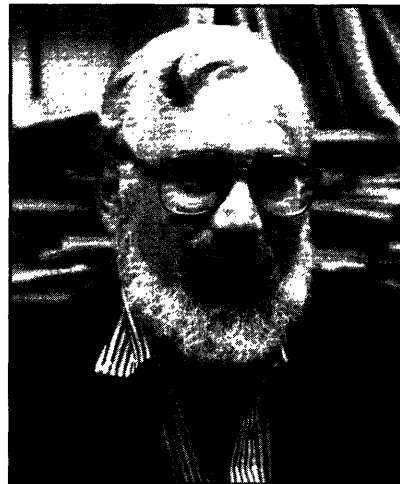
Edward J. Furniss Jr. Book Award for the best first book in the field of security studies. Dr. Posen did his undergraduate work at Occidental College and his graduate work at the University of California at Berkeley, where he earned an M.A. and Ph.D. Prior to coming to MIT, Dr. Posen was Assistant Professor of Politics and International Affairs at Princeton University. He has also held a number of fellowships: Post-Doctoral Fellow at the Center for International Affairs at Harvard; Council on Foreign Relations International Affairs Fellow; Rockefeller Foundation International Affairs Fellow and Guest Scholar at the Center for Strategic and International Studies; and Woodrow Wilson Center Fellow, Smithsonian Institution. Dr. Posen's current activities include work on nationalism and conflict, regional military balance assessment, and U.S. military strategy and force structure.




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**FACULTY**

**THEODORE A. POSTOL** is Professor of Science, Technology and National Security Policy in the Program in Science, Technology, and Society at MIT. He did his undergraduate work in Physics and his graduate work in Nuclear Engineering at the Massachusetts Institute of Technology. After receiving his Ph.D., Dr. Postol joined the staff of Argonne National Laboratory, where he used neutron, x-ray and light scattering, along with computer molecular dynamics techniques, to study the microscopic dynamics and structure of liquids and disordered solids. Subsequently he went to the Congressional Office of Technology Assessment to study methods of basing the MX Missile, and later worked as a scientific adviser to the Chief of Naval Operations. After leaving the Pentagon, Dr. Postol helped to build a program at Stanford University to train mid-career scientists to study developments in weapons technology of relevance to defense and arms control policy. In 1990 Dr. Postol was awarded the Leo Szilard Prize from the American Physical Society.



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**FACULTY**



**GEORGE W. RATHJENS** became Professor in the Department of Political Science after service with the Institute for Defense Analyses, the U.S. Arms Control and Disarmament Agency, the Advanced Research Projects Agency of the Department of Defense, the Office of the President's Science Advisor, and the Weapons Evaluation Group of the Department of Defense. Dr. Rathjens received his B.S. from Yale University and completed his

Ph.D. in chemistry at the University of California at Berkeley. He is active in a number of associations, including the Council for a Livable World of which he has been Chairman and the Federation of American Scientists of which he is Sponsor, Councilor, and Past Chairman. Dr. Rathjens' major policy interests are nuclear arms issues, post-Cold War international security questions, and environmental problems, with special emphasis on conflict and the environment.



**JACK RUINA** is Professor of Electrical Engineering. Dr. Ruina was an undergraduate at the City College of New York and did his graduate work at the Polytechnic Institute of Brooklyn, earning his M.E.E. and D.E.E. there. He has been granted the Outstanding Alumnus Award from both colleges. He taught at Brown University and the University of Illinois; at the latter he also headed the Radar Division of the Control System Laboratory. While on leave from the University of Illinois, he served in several senior positions at the Department of Defense, the last being Director of the Advanced Research Projects Agency and was honored with the Fleming

Award for being one of ten outstanding young men in government in 1962. He served on many government committees including a presidential appointment to the General Advisory Committee, 1969-1977, and acted as Senior Consultant to the White House Office of Science and Technology Policy, 1977-1980. He also held the post of President of the Institute for Defense Analyses. At MIT, he has held the position of Vice President for Special Laboratories and was Secretary of the MIT Faculty. Dr. Ruina is currently Vice Chairman of the Board of Trustees for MITRE Corporation. He was instrumental in establishing the Defense and Arms Control Program and was its first Director. Dr. Ruina's special interest is in strategic weapons policy.

**T**he seven Working Groups of the MIT Defense and Arms Control Studies Program bring together, on a weekly basis, faculty and students interested in examining a topic through individual and collaborative projects. Group sessions include research reviews, thesis presentations, guest speakers, and research design efforts. All Groups report on their progress in the spring at a DACS symposium.

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**FUTURE OF THE DEFENSE INDUSTRIES**

**Harvey Sapolsky**

*Working Group Leader*

**CONVENTIONAL FORCES**

**Barry Posen**

*Working Group Leader*

**DEFENSE/ENVIRONMENTAL STUDIES**

**Harvey Sapolsky**

*Working Group Leader*

**DEFENSE POLITICS**

**Harvey Sapolsky**

*Working Group Leader*

**NEW DIRECTIONS IN INTERNATIONAL  
SECURITY AND DEFENSE POLICY**

**George Rathjens, Jack Ruina  
and Carl Kaysen**

*Working Group Leaders*

**POST SOVIET SECURITY PROJECT**

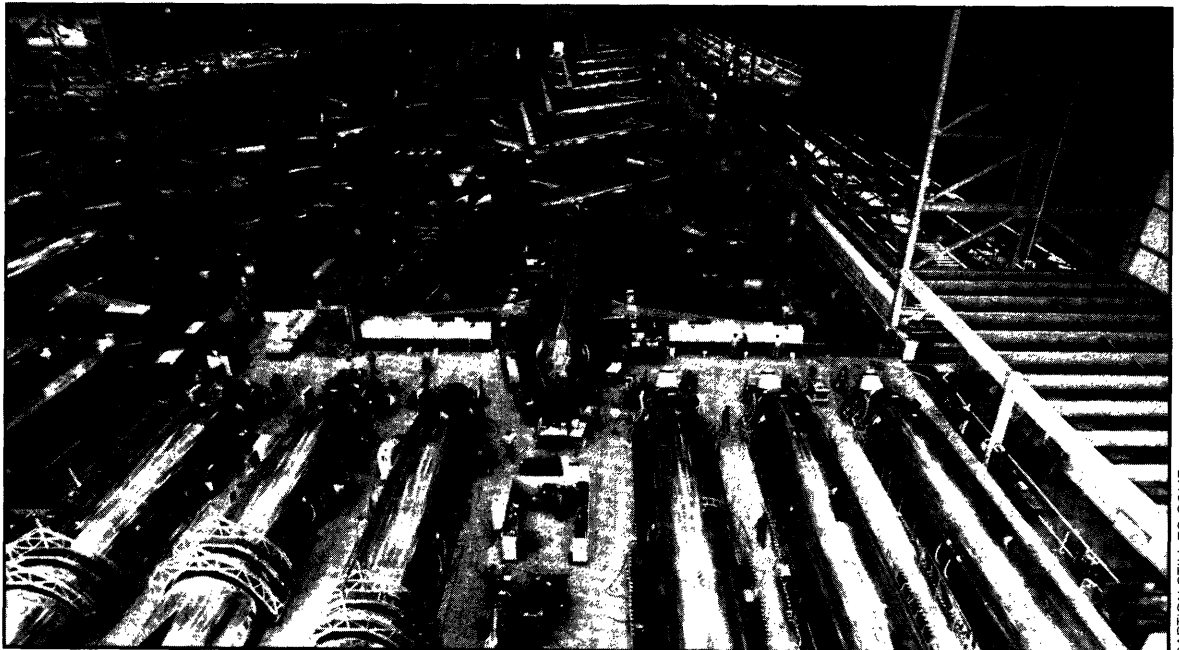
**Stephen Meyer**

*Working Group Leader*

**TECHNICAL STUDIES IN DEFENSE  
AND ARMS CONTROL POLICY**

**Theodore Postol**

*Working Group Leader*



PHOTOGRAPH COURTESY OF BOEING CORPORATION

*The work of the Defense Industries Working Group*

### DACS SEMINARS

The DACS seminar series provides a forum for discussing current security topics and the varying disciplinary perspectives on security studies. The seminars also provide an opportunity for scientifically knowledgeable individuals to join with DACS members in examining technical topics of current policy relevance. The sessions are open to the wider MIT and Boston area communities. Each is followed by a reception which allows graduate students and faculty members to meet informally with the speakers.

#### Fall 1993

**September 29 — ERIC THORSON**

House Government Operations Committee  
*Congressional Oversight of Defense Programs: The B-1, A-12, and C-17 Programs*

**October 6 — DAVID EVANS**

*The Chicago Tribune*  
*Whistle Blowers and SDI*

**October 13 — REUVEN PEDATZUR**

Senior Analyst, Jaffee Center, Tel Aviv University  
*Israeli Defense Planning and Ballistic Missile Defense*

**October 20 — TED GALEN CARPENTER**

Director of Foreign Policy Studies, Cato Institute  
*Why Collective Security Won't Happen*

**October 27 — STEVEN BIDDLE**

Research Staff, Institute for Defense Analyses  
*Desert Storm: Why Did We Really Win?*

**November 3 — LYNN EDEN**

Senior Research Associate, Center for International Security and Arms Control, Stanford University  
*Constructing Destruction: The Development of Organizational Knowledge in U.S. Nuclear Targeting*

**November 10 — YUEN FOONG KHONG**

Associate Professor of Government, Harvard University  
*Do Analogies Matter in Wartime Decision Making?*

**November 17 — DEBORAH SHAPLEY**

Author of *Promise and Power*, a biography of Robert McNamara  
*McNamara and Arms Control*

**November 24 — RICHARD SAMUELS**

Chairman, MIT Political Science Department  
*How to Succeed Without Really Flying: The Japanese Aircraft Industry*

#### Spring 1994

**February 9 — GIDEON AKAVIA**

Center for Military Analyses, Haifa Israel  
*Is Military Doctrine Possible?*

**February 16 — THOMAS MCNAUGHER**

Senior Fellow, The Brookings Institution  
*U.S. Strategy for China*

**February 23 — RANDALL FORSBERG**

Director, The Institute for Defense and Disarmament Studies  
*A New Approach to Conventional Arms Control: The Case of Combat Aircraft*

**March 2 — JOE CIRINCIONE**

Executive Director, Campaign for the Non Proliferation Treaty  
*Prospects for the Non Proliferation Treaty Renewal*

**March 30 — KENNETH MAYER**

Professor of Political Science, University of Wisconsin at Madison  
*The Design Base for U.S. Military Aircraft*

**April 6 — TAMI DAVIS BIDDLE**

History Department, Duke University  
*"Great Expectations: Anglo-American Strategic Bombing in the World Wars"*

**April 20 — ANDREW KREPINEVICH**

Director, Defense Budget Project  
*When Do We Reach the Bone?*

**May 4 — JIM GOODBY**

Ambassador, U.S. State Department  
*Averting Nuclear Chaos: The Ukrainian Case*

## THE FUTURE OF WAR SEMINARS

This is a joint seminar series with Harvard University's Olin Institute for Strategic Studies. The organizers believe that the end of the Cold War has reduced greatly the likelihood of a major power war, but do not doubt that there is a future for war nevertheless. The series was created to explore how wars are likely to occur and to be fought in the coming decades. MIT hosted the sessions during the Fall 1993 semester; Harvard was the host site for Spring 1994.

### December 2 — CHARLES MOSKOS

Professor of Sociology, Northwestern University  
*The Changing Social Composition of the American Military*

### December 16 — ALEX ROLAND

Professor of History, Duke University  
*The Feminine Perspective on War and Peace*

### April 21 — WILLIAM MCNEILL

Professor Emeritus, University of Chicago  
*The Future of War*

### May 19 — ROBERT GASKIN

Vice President of Business Executives for National Security  
*The Military Balance on the Korean Peninsula*

## SPECIAL SEMINARS, 1993/1994

### ADMIRAL WILLIAM E. TERRY, USN —

September 20, 1993

Commander, Combat Logistics Group Two, 2nd Fleet  
*Diversity in the Ranks: New Issues Concerning Married Sailors, Female Sailors, Gay Sailors, and Minority Sailors*

### GENERAL WAYNE A. DOWNING —

November 1, 1993

Commander in Chief of the United States Special Operations Command  
*The Use of Special Operations Forces: Somalia, the Gulf, and Panama*

### GEORGE W.S. KUHN — November 19, 1993

Senior Analyst, Logistics Management Institute  
*Briefing on Ground Forces Battle Casualty Rate Study*

### GENERAL VITALI YAKOVLEV —

December 14, 1993

Deputy Head of the 12th Directorate of the Russian Ministry of Defense  
*Withdrawal and Dismantlement of Tactical and Strategic Nuclear Weapons from the Ukraine*

### MAJOR DAN SHARON, USAF —

January 28, 1994

Chief, Aero-Medical Systems Division, Human Systems Center, Brooks AFB  
*Presidential Level Briefings on Casualty Expectations Prior to DESERT STORM*

### CLAUDE SERFATI — February 25, 1994

Professor of Economics at the University of Versailles  
*The French Arms Production System*  
(co-sponsored by the Institute for Defense and Disarmament Studies)

### PROFESSOR CLARK ABT —

February 28, 1994

Director of the Defense Technology Conversion Center at Boston University  
*Defense Technology Conversion and Dual Use Procurement Competition in East Asia*  
(co-sponsored by the MIT Japan Program)

### KENNETH POLLACK — March 17, 1994

DACS PhD candidate  
*The Iran-Iraq War: An Overview*

### JOHN ENDICOTT — March 21, 1994

Professor of International Affairs and Director of the Center for International Strategy, Technology, and Policy, Georgia Institute of Technology  
*A Limited Nuclear-Free Zone for Northeast Asia*  
(co-sponsored by the MIT Japan Program)

### JONATHAN SHIMSHONI — April 12, 1994

Princeton University  
*Strategic Implications of Recent Developments in the Middle East*  
(part of the Emile Bustani Middle East Seminar Series, co-sponsored by DACS)

### NICK LINKAWITZ — April 22, 1994

Deputy, Logistics Plans & Operations Division, Headquarters, Marine Corps  
*Briefing on Marine Corps Casualty Modeling Efforts*

### AMBASSADOR PAUL WARNKE —

May 2, 1994

Former Chief SALT Negotiator and Director of the Arms Control and Disarmament Agency  
*The Role of a Nuclear Test Ban for Arms Control*

### BOB WUNDERLICK — May 6, 1994

Head, Vulnerability Protection Project Office, Naval Surface Warfare Center  
*Briefing on Naval Casualty Modeling and Assessment*

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SEMINAR  
SERIES

## SELECTED PUBLICATIONS • 1993/1994

- John. R. Brinkeroff, Christopher J. Savos, and Sharon K. Weiner, "The 1992 Defense Production Act: Report on Roundtable Discussion" (sponsored by FEMA, the U.S. Army War College, and MIT), held March 4, 1993.
- Avner Cohen, "Did Nukes Nudge the PLO?," *Perspectives*, December 1993.
- Carl Kaysen and George Rathjens, "We Don't Have to Police the World All Alone," op-ed piece, *The Los Angeles Times* (Sunday Edition), September 19, 1993.
- George N. Lewis and Theodore A. Postol, "Video Evidence on the Effectiveness of Patriot During the 1991 Gulf War," *Science and Global Security*, Vol. 4 (Fall 1993).
- Peter Lieberman, "The Spoils of Conquest," *International Security*, Vol. 18, No. 2 (Fall 1993).
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- Stephen M. Meyer, "Mr. Doubtfire (Yeltsin's Military Bluff)," *The New Republic*, March 14, 1994.
- Eugene Miasnikov, "Can Russian Strategic Submarines Survive at Sea? The Fundamental Limits of Passive Acoustics," *Science and Global Security* (Vol. 4, No. 2).
- Marvin M. Miller, "A Cutoff in the Production of Fissile Material," (with F. Berkhout, H. Feiveson, and O. Bukarin) *International Security* (Winter 1994).
- Barry R. Posen, "Where's Clinton's Grand Strategy?," op-ed piece, *The Boston Globe* (Sunday Edition), October 17, 1993.
- Barry R. Posen, "The Security Dilemma and Ethnic Conflict," *Ethnic Conflict and International Security*, Michael E. Brown, Editor, Princeton University Press, 1993.
- Theodore A. Postol, Lisbeth Gronlund, George Lewis and David Wright, "Highly Capable Theater Missile Defenses and the ABM Treaty," *Arms Control Today*, April, 1994.
- Daryl G. Press, "Terrible as It Is, It's Not Genocide," (op-ed piece on the Balkans), *Los Angeles Times*, August 13, 1993.
- Jeffrey I. Sands, "On His Watch: Admiral Zumwalt's Efforts to Institutionalize Strategic Change," CNA briefing paper, #CRM 93-22 (Alexandria, VA: Center for Naval Analyses, July 1993).
- Jeffrey I. Sands, "Blue Hulls: Multinational Naval Cooperation and the United Nations," CNA briefing paper, #CRM 93-40 (Alexandria, VA: Center for Naval Analyses, July 1993).
- Harvey M. Sapolsky, "Financing Science After the Cold War," *The Fragile Contract: University Science and the Federal Government*. Eds. David Guston and Kenneth Kenniston, MIT Press 1994.
- Harvey M. Sapolsky, "Will Coming Clean Help the Clean Up?" MIT Energy Laboratory Working Paper No. MIT-EL 94-003, January 1994.
- Harvey M. Sapolsky, book review of Stuart W. Leslie, *The Cold War and American Science: The Military-Industrial-Academic Complex at MIT and Stanford*, in *Spectrum* (April 1994).
- Brian Taylor, "Russian Civil-Military Relations After the October Uprising," *Survival: The IISS Quarterly* (Vol. 36, No. 4) Spring 1994.
- Judyth L. Twigg, "The Russian Space Program: What Lies Ahead?" *Space Policy*, Vol. 9, No. 4 (November 1993).
- Sharon K. Weiner and Patrick J. Garrity, "U.S. Defense Strategy After the Cold War," in Brad Roberts, editor, *U.S. Security in an Uncertain Era /A Washington Quarterly Reader* (MIT Press, 1993).
- David C. Wright and Timur Kadyshev, "The North Korean Missile Program: How Advanced Is It?," *Arms Control Today* (April 1994).
- David C. Wright and Timur Kadyshev, "An Analysis of the North Korean Nodong Missile," *Science and Global Security* (Vol. 4, No. 2).



**WORKING PAPERS**

David T. Burbach, "Presidential  
Approval and the Use of Force"  
(DACS WP #94-1), June 1994.

**RESEARCH JOURNAL**

*Breakthroughs* Vol. III, No. 1  
Spring 1994

**DACS NEWSLETTER**

*DACS FACTS*  
Produced eight months per year.

**RESEARCH NOTES**

*Soviet Defense Notes*  
A publication of the Post Soviet  
Security Working Group.

**DACS SEMINAR NOTES**

Summaries of the DACS Seminar  
Series presentations.

## DACS FACULTY

### OUTSIDE PROFESSIONAL ACTIVITIES • 1993/1994

#### CARL KAYSEN

- In his role as co-director of the AAAS Project on Emerging Norms of Justified Intervention, attended a conference of the project's Latin American Working Group held September 20-21, 1993 at the Carter Center in Atlanta, Georgia, where 20 LA experts (half from the U.S.) discussed the issues of collective responses to regional problems in Latin America and the Caribbean. The conference papers will be published.
- Spent January 15 - February 28, 1994 in Palm Springs, CA as a Visiting Scholar at the Center for International Relations at UCLA. Participated in a two day conference on "Norms in International Politics" and continued to work on this and related problems during his stay. On February 23, delivered the Bernard Brody Lecture with the title "War, Peace and Politics: A New Connection?" This lecture is delivered annually in honor of the late Bernard Brody.
- On February 19, 1994, attended an organizational meeting in Washington to launch a joint study with members of DACS faculty, the Institute of Policy Studies and the American Academy. The group will look into the problems associated with a UN military force and will meet monthly for approximately one year.
- Attended a meeting of the American Assembly April 7-10, 1994 at Arden House, Hariman, New York, discussing non-lethal weapons and intervention.

#### STEPHEN M. MEYER

- Led a panel on the Russian economy at an intelligence community conference held May 19-20, 1993 in Washington, DC.
- Presented a paper at a conference on the Russian Military, May 22-23, 1993.
- On May 25, 1993, gave a talk on "Russian-Ukrainian Security" at the U.S. State Department.
- Attended a conference in December 1993 which was held in Hawaii as part of a regular series of meetings of the US-Japan Joint Working Group on Russia and the former Soviet Union.
- Gave a presentation at the February 4-6, 1994 Seminar XXI weekend session on "U.S. National Security Policy" held at the Aspen Institute's Wye Woods Conference Center.
- Presented a paper, in April, 1994, as part of the International Seminar held at the University of New Hampshire. The paper addressed "The Hardening of Russian Foreign Policy."
- Throughout April 1994, took part in several interviews with Radio Liberty as a commentator on changing Russian foreign policy, and Russia and NATO.

#### MARVIN M. MILLER

- Delivered a paper, "Israel and the Comprehensive Test Ban," at a workshop on Nuclear Weapons after a Comprehensive Test Ban, sponsored by The Stockholm International Peace Research Institute (SIPRI), Stockholm, Sweden, May 28-29, 1994.
- Delivered a paper, "Weapons of Mass Destruction and Advanced Delivery Systems in the Middle East," at a conference on Future Security Arrangements in the Persian Gulf, sponsored by the American Association for the Advancement of Science, Lisbon, Portugal, June 9-12, 1994.

## **BARRY R. POSEN**

- Took part in meetings of the International Fighter Study organized by the Institute for Defense and Disarmament Studies (Cambridge, MA) on May 28, 1993, where participants presented papers on future military aircraft deployment, production, and export in their own countries and globally.
- Gave a talk titled "What If Iraq Had Had Nuclear Weapons?" at a conference on nuclear proliferation sponsored by the U.S. Strategic Command and the Defense Nuclear Agency held at Offutt Air Force Base in Omaha, Nebraska (formerly SAC Headquarters) on July 7-8, 1993.
- Spoke on "Teaching Strategy and Force Planning" at the Naval War College, August 26, 1993 in Newport, RI.
- Addressed Harvard's National Security Fellows at the Kennedy School of Government on September 7, 1993.
- Having recently assumed co-directorship of Seminar XXI (the MIT program which offers training in the analysis of international issues for the national security policy community), was on hand for the program's Introductory and Reunion Session held September 13, 1993 at the Cosmos Club in Washington, DC.
- Attended the Aspen Institute's conference on "The Role of the United Nations in a Changing World," at the Musgrove Plantation in Brunswick, Georgia, November 5-7, 1993.
- On November 16, 1993, spoke at Tufts University's Experimental College on the topic of Bosnia.
- As part of his work with Seminar XXI, coordinated the first in a series of meetings on the "Future of European Security." The meeting took place in Washington, January 10, 1994.
- On Tuesday, January 18, 1994, in a lecture sponsored by the Political Science Department on "U.S. Foreign Policy in the 1990s: Intervention, Instability and Indecision," addressed the topic of "Bosnia, Haiti and Somalia: Who's Responsible for Keeping the Peace?" as part of the MIT Independent Activities Period (IAP).
- Organized and ran a Seminar XXI weekend meeting, February 4-6, 1994 on "U.S. National Security Policy" held at the Aspen Institute's Wye Woods Conference Center.
- Organized a March, 1994 Seminar XXI meeting on the topic of "Nuclear Non-Proliferation."
- Spoke at UC Berkeley's Institute of International Studies on March 10, 1994. The subject of his talk was "Nationalism, Military Power, and War." Delivered the same talk at Stanford's Institute for International Studies on March 11, 1994.
- Attended a meeting of the American Assembly, April 7-10, 1994, at Arden House, Hariman, New York.
- Attended a Seminar XXI meeting on "Regional Integration" at the Aspen Institute's Wye Woods Conference Center near Washington, DC April 29-May 1, 1994.
- Met with Admiral William Owens, Vice Chairman of the Joint Chiefs of Staff, at a May 11, 1994 breakfast sponsored by the Executive Program for Senior Officials in National Security at Harvard University.
- Made a presentation at a May 13-14, 1994 conference on "The International Spread and Management of Ethnic Conflict," at the Institute on Global Conflict and Cooperation, University of California, San Diego.
- June 23-26, 1994, attended the Conference on National Strategy at the Wianno Club, organized by the Olin Institute for Strategic Studies, Harvard University.

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## **OUTSIDE PROFESSIONAL ACTIVITIES**

## THEODORE A. POSTOL

### OUTSIDE PROFESSIONAL ACTIVITIES

- Spoke at the 5th Annual Summer Symposium on Science and World Affairs, July 1993 (co-sponsored by MIT and the Union of Concerned Scientists).
- Interviewed by ABC-TV World News Tonight on August 18, 1993 for an "It's Your Money" segment dealing with the Patriot missile.
- On February 5, 1993, lectured at Stanford University's "Radiology #237, Modern Warfare."
- Spoke at the Boston University Physics Department on February 23, 1994.
- Lectured at Harvard University's Center for Astrophysics on March 22, 1994 as part of their Freshman Seminar Program.
- Traveled to Israel in early April 1994 as a participant in a seminar jointly sponsored by the Hebrew University of Jerusalem and the BESA Center for Strategic Studies, Bar-Ilan University, and gave a talk on theater missile defense issues of relevance to the security of small states.
- Participated in a Council on Foreign Relations meeting held in New York on April 28, 1994.

## GEORGE W. RATHJENS

- On July 26, 1993, participated in a conference held at Cambridge University, England on the question of British accession to a comprehensive nuclear test ban treaty.
- On February 19, 1994, attended an organizational meeting in Washington to launch a joint study with members of DACS faculty, the Institute of Policy Studies and the American Academy. The group will look into the problems associated with a UN military force and will meet monthly for approximately one year.
- Attended a meeting sponsored by the China Institute's Center of International Relations and the Institute of Applied Physics and Computational Mathematics in Beijing, China, April 26-30, 1994. The meeting was on arms control with special reference to nuclear proliferation.

## JACK RUINA

- Attended a conference on the Future of British, French, and Chinese Nuclear Weapons, held June 2-3, 1993 at the University of California, San Diego.
- On November 10, 1993, spoke on the topic of "The Nuclear Arms Race Revisited" as part of the Distinguished Lecturer Series presented by the MITRE Institute. The series acts as a forum for well-known authorities to speak on subjects of broad interest to MITRE staff. Jack Ruina became a member of the MITRE Board of Trustees in 1967, and Vice Chairman of the Board in 1992.

## HARVEY M. SAPOLSKY

- Participated in the Navy's Global Games at the Naval War College, Newport, RI held July 15-16, 1993 as a consultant in the Science and Technology Group.
- Participated in a meeting of the Advisory Group for the World Violence Study, organized by The American Assembly of Columbia University, on September 2, 1993.
- Took part in meetings of the International Fighter Study organized by the Institute for Defense and Disarmament Studies (Cambridge, MA) on May 28, 1993.
- On October 22, 1993, gave a presentation on the Clinton Health Plan to a group of alumni and friends who were on an MIT Campus Visit hosted by the Dean of the Graduate School, Frank Perkins.
- Chaired the "Defense Conversion: Meeting the Management Challenge" conference at MIT, October 27, 1993. The conference was cosponsored by the MIT Enterprise Forum, the Industrial Liaison Program (ILP), and DACS and was organized by Wendy Elliott of ILP.
- Attended the Institute of Foreign Policy and Analysis and Tufts University's Symposium on "Ethnic Conflict and Regional Instability: the Implications for U.S. Policy and Army Roles and Missions" on November 17-18, 1993 in Cambridge.
- Gave a presentation on defense conversion to the Regional Economic Development and Defense Conversion Seminar offered by the MIT Industrial Performance Center and the MIT Urban Studies Department on December 6, 1993.
- Visited Boeing Corp. in Seattle, WA, February 1-4, 1994 and gave a talk on "The Future of the Defense Industrial Base."
- On March 17-18, 1994, attended an innovation studies meeting at the Office of Net Assessment, Department of Defense.
- Gave a presentation on the policy implications of non-lethal technologies at a March 29, 1994 meeting of the Army board on Science and Technology/National Research Council in Washington, DC.
- Gave a presentation on acquisition reform to the Lean Aircraft Initiative Advisory Board on April 27, 1994.
- Spoke at Harvard's Olin Institute for Strategic Studies on May 2, 1994. The topic was "'Fighting Blue': how nations can cope with the world's surviving superpower in an era of instability."
- Met with Admiral William Owens, Vice Chairman of the Joint Chiefs of Staff, at a May 11, 1994 breakfast sponsored by the Executive Program for Senior Officials in national Security at Harvard University.
- Spoke at a defense conversion symposium that was broadcast via the National Technology University Network from Northeastern University's TV studio, May 17, 1994.
- Attended the MIT/Navy/Industry Cooperative R&D Workshop that the MIT Ocean Engineering 13A Program organized on May 18-19, 1994.
- Spoke on the politics of defense industry in the draw down at West Point's XXXI Senior Conference which had as its theme "The Army and Society in the 21st Century" USMA, June 2-4, 1994.

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## OUTSIDE PROFESSIONAL ACTIVITIES

### **DEFENSE CONVERSION: MEETING THE MANAGEMENT CHALLENGE**

*October 27, 1993 — MIT*

The MIT Enterprise Forum, the Industrial Liaison Program, and DACS cosponsored a day long symposium Wednesday, October 27, on Defense Conversion with the special theme: meeting the management challenge. Over 100 people from the defense industry and government agencies attended the sessions which were organized by Wendy Elliott of ILP and chaired by Professor Harvey Sapolsky.

In his opening remarks, Professor Sapolsky noted that containment was one government policy that worked. For more than four decades and under nine presidents we held firm, managing neither to blow up the world nor destroy our own economy. We should, he said, now welcome the chance to relocate much of the resources and talent that had been devoted to the Cold War. The challenge and the specific focus for the MIT symposium was to “make the difficult individual and organizational adjustments required, recognizing that for this problem government actions alone are unlikely to be more than palliative.”

The size of the problem was outlined by Maxwell Morton, a partner in Grayhead Associates, and Martin Bollinger, Vice President for Aerospace Defense Practice at Booz Allen & Hamilton. Although some success stories exist, the overall track record to date has not been good. For many firms, it may already be too late as big cuts, which likely lie just ahead, destroy the opportunity for a gradual transition.

Professor Shaoul Ezekiel of the Center for Advanced Engineering chaired a panel that examined how MIT might assist in the transition. Professor Stan Weiss, a former Lockheed official and now the Head of the Lean Aircraft Project, and Glen Graham, Director of Management Consulting at the Gartner Group, were panel participants. At the lunch, Dean Joel Moses described the options MIT itself has for building partnerships with industry.

The afternoon sessions consisted of five workshops led by MIT faculty and other experts on marketing, product development, innovation, and venture financing. The workshop chairs were Edward Roberts, Eric Von Hippel, Robert Thomas, Birger Wernerfelt, of the Sloan School, and Larry Smith, CFO of Massachusetts Reinvestment Financing Agency. Dr. Dorothy Robyn, Special Assistant for Defense Conversion and Economic Policy to President Clinton was scheduled to close the symposium but instead found herself closed in at Washington National due to fog.

### **FUTURE ROLE OF U.S. NUCLEAR WEAPONS**

*February 3-4, 1994 — MIT*

With the end of the Cold War, the increasing concern about the further proliferation of nuclear weapons in countries such as North Korea and Iran, the start of negotiations on a comprehensive test ban, and the renewal of the Non-Proliferation Treaty, it is timely to contemplate the future role of U.S. nuclear weapons. Of particular concern is the impact of our actions, with regard to maintaining a nuclear weapons capability, on the proliferation of nuclear weapons.

In response to these issues, DACS and the Natural Resources Defense Council (NRDC) cosponsored a conference on the “Future Role of U.S. Nuclear Weapons.” The meeting,

held February 3-4, 1994 at MIT, gathered a stellar group of individuals from the weapons laboratories, academia, the U.S. government, as well as non-governmental organizations.

The first session of the meeting offered a spectrum of views on the future role of U.S. nuclear forces. Given such alternative visions, it is logical to ask: what are the realistic tools, in terms of facilities, manpower, and long-term commitment, needed to implement the various alternatives proposed? This question was covered in the second session. Session three focused on the implications of U.S. actions on the negotiability of a comprehensive test ban; the further proliferation of nuclear weapons; and U.S. national security. The meeting was organized by Marvin Miller and George Rathjens of DACS and Chris Paine of NRDC. A summary report is in preparation.

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**CONFERENCES  
AND SYMPOSIA**

### **INAUGURAL GENERAL JAMES H. DOOLITTLE SEMINAR AND DINNER**

*April 27, 1994 — MIT Faculty Club*

At the Inaugural General "Jimmy" Doolittle Dinner and Seminar, the General's great contributions to aviation and the role the science and technology base plays in the maintenance of national security were heralded. The featured speaker at the April 27 event was General Ronald Fogleman, USAF, the Commander-in-Chief of USTRANSCOM and its air component, the Air Mobility Command, who graciously substituted for Secretary Widnall. About 80 people attended the afternoon seminar on the future of the industrial base (which was cosponsored by the MIT Lean Aircraft Initiative), and/or the Faculty Club dinner.

The seminar examined the needs of the defense industrial base in light of the end of the Cold War. In a panel that Professor Sapolsky chaired, John Douglass, a retired Air Force General and key staff member of the Senate Armed Services Committee, discussed current acquisition reform initiatives, Tom McNaugher, a Senior Fellow at the Brookings Institution, spoke about the limits of conversion and market analogies when considering the future of defense industries, Jack Nunn, a Political Science PhD from MIT and Senior Associate at the Office of Technology Assessment, described the depth of the likely defense cuts, and Richard Samuels, the head of both the MIT Political Science Department and the MIT Japan Program, provided a comparative perspective.

General Fogleman, who taught history at the Air Force Academy, told the evening audience that we were likely soon to return to our militia roots, which makes preparedness an uncertain proposition for America. He also explained how Jimmy Doolittle's PhD greatly aided the air campaign over Germany.

The Doolittle experience was also examined in an introductory talk by C.V. Glines, the General's biographer and a frequent writer on air power topics. In another introductory talk David Lampe, the Associate Director of the Corporate Relations Office at MIT and a coauthor of a recent book on Route 128, described the vital role MIT and the local scientific community played in building the nation's economic and military strength.

The event was organized by DACS in conjunction with the MIT Aeronautics and Astronautics Department, the Lean Aircraft Initiative, MIT Air Force ROTC, the local Air Force fellows, MITRE Corporation, and the Air Force Association. Harvey Sapolsky chaired the program committee and hosted the dinner, but would like to be the first to acknowledge the excellent assistance of Annmarie Cameron, Sharon Weiner, Captain Kim Cryder, and Major Mike Hodge.

**T**he Program's courses — what MIT prefers to call subjects — are open to all students eligible to attend classes at MIT, including cross-enrollers from Harvard and Wellesley. Most of the subjects are offered at the graduate level and through the Political Science Department.

Political Science doctoral candidates may use Defense and Arms Control Studies as one of their fields of concentration. Within that context, defense and arms control studies has two principal objectives: first, it introduces the student to the study of American defense policy, including the policy process, arms control, force structure, and military budgets. Second, it introduces the student to the study of the role of force in international politics and how countries have historically pursued their security interests. Students are expected to develop competence in the methods of systems analysis, technology assessment, and strategic reasoning that shape the size and composition of U.S. strategic nuclear and general purpose forces. The international military competition, the prospects for arms control and their implications for U.S. force planning receive special consideration in several subjects. Others examine some of the same issues by contrasting U.S. experiences and approaches with those of rivals and allies.

Students who plan to offer Defense and Arms Control Studies for the general examination take two subjects from those listed below in the Forces and Force Analysis section, and one subject each from the listing in the Defense Politics and in the Comparative Defense Policy sections. Competence in technical analysis is required. A background in economics to intermediate level with particular emphasis on macroeconomics and public finance is advisable. The subjects in the Forces and Force Analysis section will provide sufficient review of the technical approaches to be examined.

The write-off requirement is three subjects with equal distribution among the three sections preferred although approval for alternative distributions may be granted in consultation with field faculty. A number of substantive fields in the Political Science Department deal with important determinants of U.S. defense programs and expenditures. Among the most closely related are: Science, Technology and Public Policy; American Politics; International Relations and Foreign Policy; and Soviet Studies. Students of defense policy are also encouraged to take subjects in economics.



## **FORCES AND FORCE ANALYSIS**

### **17.476      Analysis of Strategic Nuclear Forces (Postol) STS 516      [G]**

Introduces the assessment of strategic nuclear forces. Emphasizes the development of force requirements and methods of analyzing alternative force postures in terms of missions, effectiveness, and cost. The history of U.S.-Soviet strategic competition provides the backdrop against which the evolution of nuclear strategy and forces is considered.

### **17.477      Technology and Policy of Weapons Systems STS.076      (Postol) [U]**

Examines in detail the technology of nuclear weapons systems. Topics include nuclear weapons design, effects, targeting, and delivery; ballistic and air breathing missile propulsion and guidance; communications and early warning techniques and systems; and anti-missile, air, and submarine systems. Combines the discussion of technical materials with the national security policy issues raised by the capabilities of these technologies. Considers security issues from the distinct and often conflicting perspectives of technologists, military planners, and political leaders.

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**TEACHING  
AT DACS**

### **17.482/483    U.S. General-Purpose Forces (Posen) [U/G]**

Based on the concept of Grand Strategy as a system of inter-connected political and military means and ends. Topics covered include U.S. grand strategy, the organization of the U.S. military, the defense budget, ground forces, tactical air forces, naval forces, power projection forces, and the control of escalation. Particular episodes of military history that offer insights into current conventional forces issues are examined. Graduate students are expected to pursue the subject at greater depth through reading and individual research.

## **AMERICAN DEFENSE POLITICS**

### **17.460      Defense Politics (Sapolsky) [G]**

Examines the politics affecting U.S. defense policies. Includes consideration of intra- and inter-service rivalries, civil-military relations, contractor influences, congressional oversight, peace movements in historical and contemporary perspectives, and U.S. defense politics before, during, and after the Cold War.

### **17.471      American National Security Policy (Meyer) [U]**

Introduces the student to the problems and issues confronting American national security and the process by which American national security policy is formulated. The nature of the international system (post-World War II), the theoretical requirements for deterrence and defense, and alternative strategies for implementing American national security policy are discussed. The roles of the President, National Security Council, Department of Defense and armed services, the Congress, and public opinion in formulating national security policy are examined.

## COMPARATIVE DEFENSE POLICY

### **17.462 Innovation in Military Organizations (Posen and Sapolsky) [G]**

Explores the origins, rate, and impact of innovations in military organizations, doctrine, and weapons. Emphasis on organization theory approaches. Comparisons with non-military and non-U.S. experience included.

### **17.484 Comparative Grand Strategy and Military Doctrine (Posen) [G]**

A comparative study of the grand strategies and military doctrines of the great powers in Europe (Britain, France, Germany, and Russia) from the late 19th to the mid-20th century. Examines strategic developments in the years preceding and during World Wars I and II. What factors have exerted the greatest influence on national strategies? How may the quality of a grand strategy be judged? What consequences seem to follow from grand strategies of different types? Open to undergraduates with permission of instructor.

**TEACHING  
AT DACS**

## ADVANCED AND CROSS-FIELD OFFERINGS

### **17.465 The Nuclear Age (Rathjens and Ruina) [U]**

Based substantially on the 13-part public television series “War and Peace in the Nuclear Age.” Includes the history and technology of nuclear weapons, including the discovery of fission; the development of fission and fusion weapons; nuclear testing and efforts to control the technology; problems in the proliferation of weapons; advanced nuclear weapons technologies; changing perceptions about the role of nuclear weapons in world affairs. [Engineering school-wide elective]

### **17.479/480 Technology, Politics, and Weapons Choice (Postol) [U/G] STS.519**

Analyzes decisions to develop or acquire new weapons systems that had, or could have had, a major influence on the arms race. Examines the interplay of political and technical factors in the decision-making process. Representative weapons systems include the hydrogen bomb, the nuclear-powered submarine, tactical nuclear weapons, the Polaris submarine-launched ballistic missile, the B-1 bomber, MIRVs, the Moscow anti-ballistic defense, the U.S. Safeguard/Sentinel missile defense, and others. Graduate students are expected to pursue the subject at greater depth through reading and individual research.

### **17.492 Research Seminar in Post-Soviet Security Studies (Meyer) [G]**

An advanced seminar that examines historical and contemporary issues in Soviet and post-Soviet defense planning. Students select individual research topics and work with original source materials.

## DACS - AFFILIATED DEGREE RECIPIENTS • 1993/1994

### Kelly M. Greenhill

SM in Political Science, June, 1994

*Dropouts to Top Scouts: An Analysis of the Use of the Military as a Tool for Social Reform*

Thesis Supervisor: Harvey M. Sapolsky

Second Reader: Ellen Immergut

### Eric J. Labs

PhD in Political Science, September, 1994

*Fighting for More: The Sources of Expanding War Aims*

Thesis Committee: Barry R. Posen (Chair), Stephen Van Evera, Steven E. Miller (Harvard)

### Matthew A. Partan

PhD in Political Science, June, 1993

*The Military Fails to Act: Explaining Soviet Ministry of Defense Responses to Domestic Challenges, 1985-1991*

Thesis Committee: Stephen M. Meyer (Chair), Don Blackmer, Prof. Timothy Colton (Harvard)

### Judyth L. Twigg

PhD in Political Science, June 1994

*To Fly and Fight: Norms, Institutions, and Fighter Aircraft Procurement in the United States, Russia, and Japan*

Thesis Committee: Stephen M. Meyer (Chair), Richard Samuels, Harvey M. Sapolsky

## GRADUATE STUDENTS • 1993/1994

### PH.D. CANDIDATES — POST-GENERALS

<b>Nicholas Beldecos</b>	Princeton University (Politics)	<b>Daryl Press</b>	University of Chicago (Political Science)
<b>David Burbach</b>	Pomona College (Government)	<b>Laura Reed</b>	Harvard University (Sociology/Anthropology)
<b>Dean Cheng</b>	Princeton University (Politics)	<b>Jeffrey Sands</b>	Amherst College (American Studies)
<b>Owen Cote</b>	Harvard University (Social Studies)	<b>Taylor Seybolt</b>	Haverford College (Political Science)
<b>Randall Forsberg</b>	Barnard College (English)	<b>Robert Snyder</b>	United States Military Academy (Social Science)
<b>Sybil Francis</b>	Oberlin College (Chemistry)	<b>Jeffrey Starr</b>	University of Illinois (Mathematics/Biology, International Relations)
<b>Eugene Gholz</b>	MIT (Political Science/Materials Science and Engineering)	<b>Brian Taylor</b>	University of Iowa (Political Science) London School of Economics (Soviet Politics)
<b>Peter Goldstone</b>	University of Chicago (Political Science)	<b>Trevor Thrall</b>	University of Michigan (Political Science)
<b>Eric Heginbotham</b>	Swarthmore College (Political Science)	<b>Jeanette Voas</b>	University of Virginia (Russian Studies) University of Michigan (Soviet Studies)
<b>Dana Isaacoff</b>	Cornell University (Labor Relations) New School for Social Research (Media)	<b>James Walsh</b>	Brown University (Philosophy)
<b>Jane Kellett</b>	Oberlin College (English)	<b>Sharon Weiner</b>	Northeast Missouri State University (Political Science/Economics) Lancaster University, England (Strategic Studies)
<b>Jonathan Ladinsky</b>	University of Chicago (Political Science)	<b>Richard Wilcox</b>	The Citadel Georgetown University (International Studies)
<b>Daniel Lindley</b>	Tufts University (International Relations/French)	<b>Robert Zirkle</b>	University of Illinois (Physics, Political Science)
<b>Kevin O'Prey</b>	Grinnell College (International Relations)		
<b>Kenneth Pollack</b>	Yale University (Political Science)		

<b>Ethan McKinney</b>	University of California-Berkeley (Political Science)	<b>Chikako Ueki</b>	Sophia University (IR/French)
<b>Alexander Neff</b>	University of Michigan (Political Science/Japanese)	<b>Benjamin Valentino</b>	Stanford University (Politics)

DACS VISITORS • 1993/1994

**Avner Cohen**

*Visiting Scholar*

Avner Cohen, co-director (with Dr. Marvin Miller) of the project on Nuclear Arms Control in the Middle East, has written for over a decade on nuclear weapons-related issues, primarily the question of nuclear deterrence and morality. He has taught philosophy at Tel Aviv University, been a visiting faculty at various American universities and a fellow at the Harvard Center for Science and International Affairs. Dr. Cohen earned his PhD in 1981 from the Committee on History of Culture of the University of Chicago.

**Lisbeth Gronlund**

*Visiting Scholar*

Lisbeth Gronlund is a Senior Staff Scientist at the Union of Concerned Scientists, a public interest research group based in Cambridge, MA. After receiving a PhD in theoretical physics from Cornell University in 1988, she made her first foray to DACS, spending two years as a postdoctoral fellow. She then became a senior visiting scholar in the Center for International Security Studies at the University of Maryland, College Park, and is currently on the Executive Committee of the American Physical Society's Forum on Physics and Society. Dr. Gronlund's research has focused on technical aspects of arms control, and she has written on the issues of depressed-trajectory ballistic missiles, space-based and ground-based ballistic missile defenses, and the proliferation of ballistic missiles. She is currently carrying out a study, with other members of the DACS Technical Working Group, on the implications of advanced theater missile defenses for the ABM Treaty.

**Major Michael Hodge, USAF**

*Air Force Military Fellow*

Major Hodge is an Air Force Special Operations helicopter pilot who possesses a broad operational and staff background with assignments in airlift support, combat search and rescue, special operations, and a recently completed Pentagon tour at Headquarters Air Force in the Special Operations Division. Major Hodge's operational background includes assignments in Alaska, Asia, and Florida. He has been credited with over 70 lives saved and participated as a flight leader in Operations JUST CAUSE, DESERT SHIELD, DESERT STORM, and the search for Congressman Mickey Leland in Ethiopia. He has been recognized for service by the Republic of Korea and was named the Air Rescue Pilot of the year in 1986 and the Military Airlift Command Pilot of the year in 1988. While an action officer on the Air Staff, Major Hodge was involved in a myriad of issues and policy-making events including the roles and missions debate and Air force restructuring initiatives. Specifically, he participated in efforts to develop streamlined and joint pilot training, address acquisition of the V-22 Osprey aircraft, establish DoD policy on use of night vision technology, set direction for post Cold War force restructuring, and establish a joint acquisition system for rotary wing projects.

**George Lewis***Post-Doctoral Fellow*

George Lewis spent five years as a research associate in Cornell University's Department of Applied Physics after receiving his PhD in experimental solid state physics from there in 1983. Prior to coming to MIT in 1989 he was a fellow in the Peace Studies Program at Cornell and at the Center for International Security and Arms Control at Stanford. His research has included studies of arms control and verification for sea-launched cruise missiles and other non-strategic nuclear weapons, air surveillance and early warning systems, and the effectiveness of tactical missiles and of defenses against such missiles (with an emphasis on the performance of Patriot in the 1991 Gulf War). Dr. Lewis is now conducting research on a number of issues relevant to ballistic missile defense.

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**DACS VISITORS****Eugene Miasnikov***Post-Doctoral Fellow*

Eugene Miasnikov, an oceanographer, spent several months at DACS under a grant from the W. Alton Jones Foundation to perform independent research in conjunction with the DACS Working Group on Technical Studies in Defense and Arms Control Policy. Eugene, who was born in Russia, received his PhD degree in physics from the Moscow Institute of Physics and Technology (MPRI) in 1988 and is a member of the MPTI Center for Arms Control, Energy and Environmental Studies, where he has been investigating antisubmarine warfare capabilities.

**Reuven Pedatzur***Research Fellow*

A fighter-pilot in the Israeli Air Force reserves, Dr. Pedatzur has taught Israeli Defense Policy at the I.D.F. Military Academy and at Tel Aviv University, where he was a Research Fellow at the Jaffee Center for Strategic Studies. For the last ten years he was a defense analyst for *Haa'aretz* daily newspaper and more recently the Israeli correspondent for *Jane's Defence Weekly*. Dr. Pedatzur, who earned his PhD in political science from Tel Aviv University in 1993, has been writing on ballistic missile defense and has just completed a study on the Arrow — the Israeli defense system. He is currently examining Patriot's Gulf War performance.

**Paul Podvig***Post-Doctoral Fellow*

Paul Podvig, a laser physicist from Russia, is working with Professor Ted Postol on ballistic missile defense-related issues. A 1988 graduate of the Moscow Institute of Physics and Technology (MPTI), he has been an assistant professor in MPTI's General Physics Department since 1990. Paul is a staff member of the MPTI Center for Arms Control, Energy and Environmental Studies. Paul completed a translation of Soviet Nuclear Weapons (a publication of the Natural Resources Defense Council). The W. Alton Jones Foundation has sponsored his visit.

**Alexei Romanov***Post-Doctoral Researcher*

Since 1985, Dr. Romanov has specialized in automatizing the reception of remote sensing data, computer processing of these data in quasi-real time, the organization and carrying out of airborne and ship-truth field experiments on remote sensing data validation and verification, the design and construction of hardware and software for receiving NOAA and COSMOS - METEOR APT satellite data, and the joint processing of space, oceanographic, and shipboard optics information. He received his PhD in 1984 from the Moscow Institute of Physics and Technology (MPTI) in technical sciences. Recently, Dr. Romanov has begun to investigate space industry conversion problems from the perspective of the need to monitor ocean and earth surfaces for ecological studies. He is currently studying the capabilities of space-based sensors to detect, identify, and track missile launches.

### **Vitaly Tsygichko**

*Visiting Scholar*

Col. (ret.) Tsygichko is a former artillery officer who joined the Soviet General Staff in 1964 and later headed the Theater Force Modeling Department within the institute of the General Staff that provided quantitative analytical support to the Ministry of Defense. He holds the posts of Senior Analyst at the Institute for Systems Studies and Director of the Center for National Security and Strategic Stability Studies at the Russian Academy of Sciences. A Doctor of Technical Sciences, Col. Tsygichko came to MIT under the auspices of DACS's Soviet Security Studies Working Group to work with Professor Stephen Meyer and doctoral candidate Matthew Partan on a study of Soviet approaches for modeling theater-level military operations. The project (based on a Soviet perspective) will also analyze the potential military applications of such models for future planning in the Russian army.

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#### **DACS VISITORS**

### **Captain Ted Wile, USN**

*Navy Federal Executive Fellow*

Captain Ted Wile is a surface warfare officer and a subspecialist in East Asian security affairs. Captain Wile has served in a variety of surface ships and has commanded a mine-sweeper and a Knox-class frigate. His shore assignments have included the Naval Postgraduate School at Monterey where he earned a Master of Arts degree in international security affairs and assignment to the Office of the Chief of Naval Operations (OPNAV 611) as a desk officer for the Middle East, Indian Ocean, and Africa. Capt. Wile also served as a DoD exchange program officer assigned to the Department of State (Bureau of Politico-Military Affairs) where he was responsible for the South Pacific, Australia, New Zealand, and the Indian Ocean islands. He headed the US delegation for semi-annual consultations with the UK on matters involving Diego Garcia and was a member of the US INCSEA delegation. Captain Wile's most recent assignment was on the staff of the Commander-in-Chief, U.S. Pacific Fleet in Honolulu, where he was Section head for Strategy, Planning and Policy.

### **David Wright**

*Visiting Scholar*

David Wright received his PhD in theoretical condensed matter physics from Cornell University in 1983, and held physics research positions until 1988. He received an SSRC-MacArthur Fellowship in International Peace and Security to retrain in international security issues, and spent two years in the Center for Science and International Affairs at Harvard University. Thereafter he joined the staff of the Federation of American Scientists as a Senior Arms Control Analyst and has been a Senior Staff Scientist at the Union of Concerned Scientists. He is a member of the Social Science Research Council's Committee on International Peace and Security. Dr. Wright's recent research has included depressed-trajectory SLBMs, strategic defenses after the Cold War, and the proliferation of ballistic missiles and nuclear weapons. At DACS he has focussed on the distinction between tactical and strategic missile defenses and an evaluation of the proposed Theater High Altitude Area Defense (THAAD) system, and the implications of advanced missile defense systems for the ABM Treaty.

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
Defense and Arms Control Studies Program  
292 Main Street (E38-603)  
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